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XXVI.—*Descriptive Notes on a nearly entire Specimen of Pleurodus Rankinii, on two new Species of Platysomus and a new Amphicentrum, with Remarks on a few other Fish-remains found in the Coal-measures at Newsham.* By ALBANY HANCOCK, F.L.S., and THOMAS ATTHEY.

[Plates XVII. & XVIII.]

Pleurodus Rankinii, sp. ined., Agassiz.

Several years have elapsed since we first obtained specimens of the peculiar little tooth named by Agassiz *Pleurodus Rankinii*: a few only occurred; they were found at Cramlington. Since then several specimens of it have been procured at Newsham and Kenton, but never in any great abundance.

The tooth is, we believe, all that has been known, up to the present time, of this reputed Selachian. In the spring of last year (1870), however, we had the good fortune to meet with the remains of an almost entire specimen of this fish at Newsham, exhibiting a crushed head containing the teeth, most of the body, with thoracic expansions, a dorsal spine, and the shagreen covering or skin (Pl. XVII. fig. 1). In addition to this interesting specimen, a detached head with the teeth, and a separate spine, have also occurred in the same locality.

These discoveries are highly important, inasmuch as they seem to demonstrate not only that this species is a Selachian, but that it is a Cestracient, not far removed from the curious Permian form *Wodnika*, Münster. This relationship is not only seen in the general characters of the teeth, but also in the similarity of the shagreen and in the form and grooving of the dorsal spine.

The specimen lies apparently on its belly, and measures a little more than three inches from the front of the head to the

posterior tapering extremity of the body, which has lost the tail, and is a little less than two inches wide across the thoracic expansions, which are just behind the head. The contour is much obscured by the scattering of the tubercles composing the shagreen; and the slab has been broken away so as to remove a part of the left side of the specimen. A portion of the counter slab, however, has been saved; and on this the left thoracic expansion is sufficiently revealed. The head (Pl. XVII. fig. 1, *a*) lies immediately in front of and in connexion with the body, but it is so much distorted that the form cannot be determined: it is about five eighths of an inch long. No bones are distinguishable; but the substance is here a little thickened, indicative of the cartilaginous remains of the cranium; nor is there anywhere in the body the least appearance of bones, the skeleton undoubtedly having been cartilaginous throughout. The teeth (*b*) lie within the area of the head, in a disturbed condition, some with the crown uppermost, others with it downwards. They do not seem to have been numerous, but are so obscured that the exact number cannot be ascertained. In the detached head, however, ten or a dozen can be counted; but there is no certainty that the number may not have been greater; indeed it is probable that some have been removed with the counter slab.

The body suddenly widens immediately behind the head, the width being considerably increased by the thoracic expansions (*c, c*), which extend about halfway down and appear to have had their margins pointed; thence it tapers backwards, and soon dies out, there being no definite indication of the form of this portion; and, as has been already stated, there is no trace of the tail. The spine (*d*) is situated a little behind the thoracic expansions; consequently it is nearer the posterior than the anterior extremity. It projects from the dorsal margin, and is inclined backwards, apparently in its natural position, marking the situation of the dorsal fin; but no traces of this remain. About two thirds of the spine is in a good state of preservation, the other third being well and sharply defined in cast; it is straight and stout in proportion to its length, and tapers somewhat abruptly to a sharp point; it is compressed laterally, with the anterior margin thicker than the posterior; the surface is coarsely and irregularly grooved and ridged longitudinally; it measures five eighths of an inch in length, and is at the thickest part one eighth of an inch wide.

Shagreen covers the whole of the specimen, defining its extent and form, though, as already noticed, with no great precision, as the margins are much blurred by the displace-

ment of the shagreen-tubercles ; but, notwithstanding this disturbance, towards the margins in many places considerable patches of them lie in their natural order, particularly on the right thoracic expansion, on a large portion of which the shagreen is entire. The tubercles are very minute, requiring a powerful lens to exhibit them, and the lower powers of the microscope to display their characters. They are many-sided, irregularly formed bodies, closely fitting together like mosaic work ; the surface is a little raised and beset with irregular rugæ. This is the appearance presented where the shagreen is undisturbed ; but it is doubtful whether it may not be the under surface that is presented to view. In places where the tubercles are scattered numerous shining bodies are observed ; these are about the same size as the tubercles, and, like them, are irregular in form, but are more gibbose, and have a ridge or two on the surface, which are produced into points at one of the sides. From analogy we might suppose that these bodies exhibit the upper surface of the shagreen-tubercles ; but further observations are required to determine this point.

The teeth are boss-like in form, somewhat elongated and ridged or carinated along the longer axis ; the sides are considerably expanded in the centre, the expansions dying out towards the ends of the tooth ; usually the expansion is more produced on one side than on the other, and the ridge inclined to the opposite side. The expansions are frequently transversely ridged or plaited, and sometimes tuberculated. The central ridge or carina of the crown is arched in the long axis of the tooth, following the curvature of the surface, and is frequently reduced, as if by wear. The whole surface of the tooth, as well as the lateral expansions, is covered with a thick brownish-white enamel, and is coarsely punctate, the punctations being most conspicuous when the enamel is worn off. The tooth measures two tenths of an inch in length : a variety, however, four or five of which have occurred at Kenton, is twice that size ; but it is more oblique than the small form, has no coronal carina, and is broad and rounded on the upper surface ; in all other respects it agrees with the small and usual form. It is quite possible that these large teeth may belong to another species.

From the above description it will be perceived that *Pleurodus* is a not very distant ally, as we have already stated, of *Wodnika*, of the Magnesian Limestone, the relationship being seen in the characters of the spine and shagreen, and particularly in the form of the teeth : in both genera they have the same boss-like, carinated crown, with expanded lateral margins, more or less ridged or crenate ; in both, too,

they are coarsely punctate, and covered with a stout, highly polished enamel.

We are thus assured that *Pleuroodus* is a Cestracient; and such being the case, its small size is very remarkable. But it must be mentioned that if the large teeth are mere varieties of the small and usual form, then our specimen may not by any means be fully grown; however, after making every allowance for increase in size on this account, still the species would be a very small Cestracient, most of which are of considerable dimensions. *Wodnika*, which is a small species, judging from Münster's figure*, cannot have been less than a foot long. It is nevertheless quite possible that our specimen is, notwithstanding, a fully developed individual. This is rendered probable by the fact that the teeth in connexion with it are of the usual size of those found detached at Newsham; and of such we possess thirty or forty: some of these are smaller than those connected with the specimen; scarcely any are larger; or if so, there is a mere shade of difference in this respect. In the separate head before alluded to, the teeth are likewise of the usual size; and the second or detached spine already mentioned is not quite so large as that in connexion with the fish.

Platysomus rotundus, n. sp.

A very distinct and beautiful species of *Platysomus* has occurred at Newsham; three almost perfect specimens of it have been met with, and four or five considerable portions, all of which exactly agree in character, though they vary a little in size. The largest and most perfect specimen is three inches long, measured from the clavicle to the end of the tail-fin, and is two inches and three quarters deep at the widest part. It is in a fine state of preservation; the contour is perfect, with the exception of that of the head, which is moderately developed in proportion to the body; the cranial bones, however, are dislocated and thrust a little forward; but apparently the head would not project much were they restored to their natural positions. The dorsal margin, from the occipital crest to the root of the tail, is regularly and deeply convex; so is the ventral margin in its whole extent from the clavicle downwards; the body of the fish, including the head, is therefore almost circular. The pectoral fins appear to have been well developed, but they are badly displayed; the ventrals are also very indistinct, though sufficient of one of them is seen for verification†: the dorsal and anal are well preserved; they

* Beiträge, Heft vi. p. 48, Taf. 1. fig. 1 a to d.

† As the existence of ventrals in *Platysomus* has been doubted, we take

are placed opposite to each other, terminating in front of the caudal peduncle, and anteriorly near the centre of the body; the anterior portion of each is considerably prolonged, and the articulations of the rays are much longer than wide. The caudal fin is well developed, with the lobes, which are nearly of equal length, only slightly recurved at the extremities.

The scales (Pl. XVII. fig. 2) are rhomboidal, long, narrow, and exceedingly delicate, the thickening of the anterior margin being very inconspicuous at the surface, so that the usual ribbed appearance is scarcely observed: the upper surface is finely and regularly striated longitudinally, the striae being raised a little, undulated, and almost parallel to the margins of the scale; they occasionally bifurcate, and, though minute, are relatively strong and few in number, there being not more than eight or ten on each scale. The length of the scale, including the peg, is five sixteenths of an inch; the peg is long and pointed. The occipital crest, all the bones of the head, gill-covers, clavicle, and mandibles are striated in the same manner as the scales. The mandibular teeth are minute, conical, and pointed; those of the maxillaries are of the same character, but more minute; on the premaxillaries they seem a little larger.

This is a very distinct species, and is at once distinguished from *P. striatus* by its small size and the much greater delicacy of its parts: the scales of *striatus* are wide, thick, and coarse in comparison with those of *P. rotundus*, in which they are thinner and much narrower than in any other species with which we are acquainted; and, moreover, the striae in *P. striatus* are much more numerous and more oblique. The same features equally distinguish our new species from *P. gibbosus*, which is apparently a close ally of *P. striatus*. On account of its small size, it might possibly be confounded with *P. parvulus*: but the scales of the latter are twice the width of those of the former, and the striae are much more numerous; the head-bones, too, are tuberculated, while in *P. rotundus* they are, as we have already pointed out, striated; the teeth of *P. parvulus* are likewise considerably larger.

Of the inedited species *P. declivis*, Agassiz, we know very little, but understand that the scale is similar to that of *P. striatus*; the name, too, so far as it is descriptive, is certainly not specially applicable to *P. rotundus*.

this opportunity of stating that a specimen of *P. parvulus* in our possession displays distinctly the pectoral, ventral, and anal fins, the form of one of the ventrals being well defined: it is small and narrow.

Platysomus Forsteri, n. sp.

We have in our possession considerable portions of three specimens of another species of *Platysomus* that appears to be undescribed; they were all obtained at Newsham. Unfortunately, the general contour cannot be traced in any of them; the fins are not present; and though many of the cranial bones are well preserved, they are all scattered. We shall therefore have to rely mainly on the scales for specific characters. The scales (Pl. XVII. fig. 3) however, are, sufficiently marked to distinguish the species from all its congeners, and are in good condition. They are large, measuring nine tenths of an inch in length, including the peg, and two tenths of an inch wide; they are consequently long and comparatively narrow; the form is rhomboidal; the peg is long, and tapers gradually to a fine point; the smooth anterior margin of the scale is rather wide, the rest of the surface being covered with close-set, raised, longitudinal striæ, which are somewhat undulated and slightly diagonal, passing upwards a little inclined towards the front or smooth border, and becoming finer as they approach it: they very rarely bifurcate; and new striæ are abruptly introduced, and do not originate in other striæ.

The head-bones, occipital crest, gill-covers, clavicle, and mandibles are all striated like the scales. The mandibular teeth are large, conical, stout, and obtusely pointed; those of the maxillæ are small, conical, and tubercle-like, with wide bases and recurved pointed apices, and are disposed without order along the alveolar border.

This fine species cannot measure less than *P. striatus*, and at first sight, so far as the scales are concerned, might be confounded with it; but on attentive examination, they are seen to be very different. They are much longer and narrower; and while these are rhomboidal, those of *P. striatus* can scarcely be so designated, being more nearly oblong. The striæ are coarser and much less oblique in *P. Forsteri*; the peg is longer, more slender, and with a sharper point. Indeed, from the form and character of the scales, it would seem that this species is more nearly allied to *P. rotundus* than to *P. striatus*. *P. gibbosus* is distinguished by having some of the cranial bones granulated, which is not the case with our new species; and, besides, the scales of the former resemble those of *P. striatus*, according to the figures in Agassiz's 'Poissons Fossiles,' vol. ii. tab. 15. *P. declivis* would appear also to have the scales of similar proportions.

This species is named after G. B. Forster, Esq., of Backworth, who has kindly granted every facility for the examina-

tion of the shale at Newsham, without which valuable privilege much of our knowledge of the palæontology of the Low Main could not have been attained.

Amphicentrum striatum, n. sp.

A new species of this rare and interesting genus has been found at Newsham; seven or eight specimens have been obtained. It differs by well-marked characters from the *A. granulatum*, Huxley, the only other known member of the genus, and it is much smaller. The contour of the new species is rhombic, the trunk being a little wider than long, measured from angle to angle; the dorsal and ventral angles are not much produced. The head is small and conical, with the muzzle forming the anterior angle; the upper and lower margins are continuous with the dorsal and ventral lines of the trunk. The cranial bones are too much disturbed to admit of particular description; they are, however, covered with a lustrous enamel, and are ornamented with strong striæ and tubercles, which irregularly run into each other. The fins are almost entirely wanting in our specimens; only one of them shows a little of the dorsal, which appears to be very delicate; and another a portion of the caudal.

The scales are well preserved in three or four specimens. They are oblong, perhaps somewhat rhomboidal, and are much longer than wide; the peg is long; they become smaller towards the dorsal and ventral margins of the trunk, where they are strongly tuberculated: the large central scales, of which there are three series in depth, have their extremities also a little tuberculated; but their middle and greater portions are covered with strong, somewhat irregular, raised, longitudinal striæ; so that the trunk of the fish has tuberculated dorsal and ventral belts, with the central portion striated.

The V-like arrangement of the dental tubercles, so far as we have been able to examine it, is the same as in *A. granulatum*; and the mandibular dental plates, which are frequently found detached, do not seem to differ in any important respect from those of that species, size being the chief distinguishing feature. The length of the body, including the head, is two inches, and its depth from the dorsal to the ventral angle an inch and three quarters.

This is a very beautiful species, and is at once distinguished from its congener by its small size and, particularly, by the striæ on the middle portion of the body, which ornamentation contrasts well with the strong marginal tubercles, the whole being coated with brilliant enamel.

Cœlacanthus lepturus, Agassiz.

We have long had in our possession certain mandibuliform bones from the Newsham shale, evidently piscine, though we could not make out to what species or even to what genus they belonged; and it was not till some short time ago, when we fortunately obtained a crushed head of *Cœlacanthus*, that the enigma was solved. This specimen exhibits our supposed mandible in connexion with the rather strangely formed bone figured and described in the 'Memoirs of the Geological Survey,' Decade 12, by Professor Huxley, as the mandible, and so placed in relationship to it that it became at once evident that the mandible of Huxley is merely the articular piece, and our supposed mandible the dentary bone.

The articular piece is well represented in the memoir referred to. We have three or four isolated specimens of it in a good state of preservation; also one or two others in connexion with the bones of the head and united to the dentary bone. The articular piece (Pl. XVII. fig. 4, *a*) is long and narrow, with a large arched lobe rising from the upper margin and situated a little nearer to the proximal than the distal extremity; the proximal extremity is obtusely pointed, and the upper border is occupied by a narrow longitudinal channel (the glenoid surface, *b*), which widens a little backwards and is twisted or inclined to the external surface; the borders of the distal extremity are nearly parallel, and in front it thins out and is diagonally truncated forwards and upwards. Our largest specimen is about two and a half inches long, and at the widest part measures five eighths of an inch across.

The dentary bone (fig. 4 *c*) is as peculiar in form as the articular piece: it is narrow and semicylindrical in front, the outer surface being convex, the inner channelled or concave; the posterior portion, more than half the entire length, widens backwards, and has the upper and lower borders somewhat thickened; the proximal extremity thins out, is truncated diagonally downwards and backwards, and has the lower border, which is the longer, produced into a point. The whole bone is strongly arched, the lower margin being regularly convex; the symphyseal surface is not distinguishable, and was probably formed chiefly by the cartilage that undoubtedly occupied the groove or channel of the inner surface.

The teeth (*d*) are placed on the upper border of the expanded portion, and extend in a close series of from six to eight from the posterior extremity almost to the junction of the border with the anterior semicylindrical portion of the bone: the dentary area is thus very limited. The teeth are

small, short, stout, conical, and obtusely pointed, and seem to be firmly ankylosed to the bone.

The dentary bone has apparently been united to the articular piece by a squamose suture; but, howsoever this may have been, it is evident that the attachment was only slight, as the two bones are frequently found detached.

The maxillary teeth are well developed; they are larger than those of the mandible, are stoutish at the base, decidedly recurved and sharply pointed; but we are unable to determine their number and arrangement, on account of the disturbed condition of our specimens. There are teeth on both the maxillæ and præmaxillæ. In addition to these dental organs, the vomer is armed with close-set, minute, rounded tubercles or teeth. This is undoubtedly the same spatulate dentigerous bone figured and described in the 12th Decade of the Geological Survey by Professor Huxley as the parasphenoid or vomer in *Macropoma*: in form and position it is very similar.

Ctenodus, Agassiz.

The body-scales of *Ctenodus* are entirely unknown, with the exception of those of *C. elegans* and *C. obliquus*, which we described some time ago*—the former in a good state of preservation, the latter in a less perfect condition. We have, however, obtained from time to time numerous fragments of large scales, so frequently associated with the remains of the larger *Ctenodontes* that we can have little doubt they belong to them†. Among these fragments are four or five which exhibit the greater portion of the contour of the scale, and one which has it almost entire. These are all parallelogramic in form,

* Ann. Nat. Hist. ser. 4. vol. i. p. 77.

† As this paper was passing through the press, we obtained complete proof of the truth of this opinion in a fine specimen of the greater portion of a cranium and part of the trunk of a large *Ctenodus* with the opercular plates attached: a considerable number of the ribs are exhibited in connexion with the head, disposed in natural order; and numerous neurapophyses and apparently interneural spines are scattered along the dorsal ridge. Everywhere mixed up with this interesting specimen these peculiar scales are found, much broken, indeed, but occupying both sides of the body portion of the fish, in such a manner as to leave no doubt on the subject. The scales are very similar to those described in the text, differing only specifically, the margin being wider; the smooth central area has the same peculiar minute surface-structure, and the upper surface is minutely granulated in the same manner. Moreover this specimen shows the hatchet-shaped bones, or clavicles, described by us on a former occasion, in connexion with the cranium, almost in their natural positions; so that here we have not only proof respecting these scales, but the true nature of the hatchet-shaped bones is also established.

are thin and delicate, and apparently represent three species, though the distinguishing characters are slight.

The first (Pl. XVIII. fig. 1), the largest and most perfect specimen, measures two and a half inches long, and upwards of two inches wide. The sides are parallel; the anterior extremity (*a*) is a little arched outwards, and the posterior or exposed extremity (*b*) is rounded; the angles are rounded off; the central area (*e*), under an ordinary hand-lens, appears quite smooth, and is bordered by a rather narrow margin (*c*), having several concentric undulations or lines of growth, and marked with minute radiating striæ; no growth-lines are visible within the marginal border. On examination with the inch object-glass, the central area is found to be finely reticulated with slightly elevated bony fibres, the meshes being sunk, so that the surface is minutely and regularly punctate. This is undoubtedly the underside of the scale; the upper surface is revealed on fragments, and, at a rupture (*d*) near the centre of the rounded exposed extremity, is minutely granular. Of course, in the latter case, it is only the cast of the upper surface that is seen; and at this point it is evident that the granules are enlarged and become arranged so as to form imperfect and very irregular vermicular grooves.

The second species (fig. 2) is less perfect than that just described; the greater portion, however, of the scale is preserved; but the border of one side is gone, as well as the posterior margin and part of the anterior. The sides are slightly convex, and so is the anterior extremity, the angles being rounded; the border (*c*) is wide, and distinguished by several concentric lines of growth and fine minute radiating striæ, as in the first species. The central area (*d*) is likewise similar; but the minute surface-structure is finer, and the bony network has the meshes drawn out in the long axis of the scale; the punctures, too, are not so large and distinct. This fragment (for fragment it is) measures two inches long, and one inch and one eighth wide.

The third species, which has lost the greater portion of the rounded posterior extremity, and is in other respects imperfect, is upwards of an inch and three fourths long; it seems to have been more nearly square than either of the other two forms, and is characterized by a very narrow border, which shows only one or two concentric lines of growth and minute radiating striæ. The bony network of the central area is fine and indistinct, with a longitudinal arrangement of the meshes, as in the second species; the punctures are numerous, rather large, and longitudinally oval.

The last description is apparently of a mere cast of the

under surface; but a small portion of the scale, exhibiting the upper surface, is adherent, and proves that it is minutely striated in an irregular broken manner, the striæ for the most part having a longitudinal disposition.

The peculiar rectangular form distinguishes these from all the cycloid scales with which we are acquainted; and they are much thinner than any other of the *large* scales of the Coal-measure fishes. The only scale that can be compared to them in this respect is that usually attributed to *Rhizodus*—the scale which we described some time ago as belonging to *Archichthys**. But this scale is pretty regularly rounded, is more coarsely granulated on the surface, and usually exhibits concentric lines of growth over the whole surface; it is also generally found split open, exposing to view the internal structure, when the concentric lines of growth and minute radiating striæ are sharply defined over the entire surface. The scale of *Ctenodus* is never seen with the internal structure thus exposed; at least we have never seen the concentric lines of growth and radiating striæ pass beyond the border, the under surface being usually exposed to view. This is well shown in our second species, the specimen being preserved on one slab in relief, the cast of the underside in intaglio on the other. This specimen, too, enables us to judge of the thickness of the scale, as it is evident the entire substance of it is present, and that it is not torn open by the splitting of the shale.

The rectangular outline of these scales we have just pointed out as peculiar; and in this respect these large scales agree with those we previously described of *C. elegans* and *C. obliquus*, the former being the smallest known species of the genus. And here we must not overlook the similarity both in form and size of these large *Ctenodus*-scales to those of the so-called *Ceratodus Forsteri*, as figured and described by Dr. A. Günther in his valuable memoir on this remarkable Australian fish, recently published in the ‘Philosophical Transactions.’ This resemblance is very striking in our second species, in which the sides are nearly parallel, being a little arched outwards, much in the same way as they are in the recent species. In both forms the scales are of an extraordinary size: those of *Ceratodus Forsteri* are two inches and three eighths long, and one inch and six eighths broad; the largest *Ctenodus*-scale measures two inches and a half in length, and an inch and a half in breadth; and that of *C. elegans*, which is quite a small species, is remarkably large for the size of the fish.

* Ann. Nat. Hist. ser. 4. vol. v. p. 266.

We have shown on a previous occasion that the dental plates of *Ctenodus imbricatus* are so similar to those of the Australian fish that without other aid they could not be generically separated; and we now see that in the peculiar form and great size of the scales the similarity is equally striking.

Gyracanthus tuberculatus, Agassiz, and *Cladodus mirabilis*, Agassiz.

We believe we were the first to point out that certain minute bodies found associated with the remains of these two species are dermal tubercles *. When we wrote our remarks on the subject we described two forms of these peculiar bodies—one considerably larger than the other, and having from four to seven cusps with carinæ on their convex surfaces, the smaller form having only two or three smooth points. And we thought both varieties belonged to *Gyracanthus*, having found the large scattered amidst the small form (which latter was by far the more numerous), and both associated with the spines of that fish and with the teeth of *Cladodus*. We have long been satisfied, however, that this was a mistake, and that, while the small form is the dermal tubercle of *Gyracanthus*, the large variety is that of *Cladodus*. This is satisfactorily proved by numerous specimens in our possession, in which the small variety unmixed with the other is associated in large patches with the spines and other remains of *Gyracanthus*; while the large form has occurred on several occasions, unaccompanied by the small variety, on the same slab with the teeth of *Cladodus* and the spines of *Ctenacanthus hybodontoides*. This has so frequently happened now, that it is impossible any longer to question the fact that the two forms belong respectively to these two large Selachians. And we are also satisfied that the so-called tooth *Mitrodus quadricornis* of Owen is the larger form of these dermal tubercles, as we originally asserted, and consequently belongs to *Cladodus* or *Ctenacanthus*, and not to *Gyracanthus*, as we at first thought.

We have much pleasure in observing that the dermal nature of these minute spinous bodies has recently been confirmed by the researches of Mr. James Thomson, of Glasgow, who has found the large form associated with the teeth of *Cladodus mirabilis* and the spines of *Ctenacanthus hybodontoides*†.

* See paper entitled "Notes on the Remains of some Reptiles and Fishes from the Shales of the Northumberland Coal-field," Ann. Nat. Hist. ser. 4. vol. i. p. 370.

† See paper entitled "On a Specimen of *Acanthodes Wardii* from the

This gentleman, however, seems to confound *Diplodus* with these dermal tubercles, and to consider the remains of the semicartilaginous skeleton to be shagreen. It is to Professor Williamson that we owe the discovery of the true nature of this peculiar substance, who clearly proves it to be the remains of what he terms the chondriform bone or semicartilaginous skeleton*.

In a former communication† we described a large triangular bone associated with the spines of *Gyracanthus* as one of the carpals. We have now to notice a second carpal, several of which have occurred on the same slabs with the spines and triangular bones. In one instance the two spines are associated with one triangular bone and two of our second carpal. This second form is probably the inner carpal: it is a broad, flat bone, irregularly bilobed, or somewhat reniform, with one of the lobes produced and the external margin straightened; the convex border is a little flattened, angulated, and thickened; thence the bony fibres radiate to the opposite or lobed margin, which gradually thins out. It measures in the transverse or longest diameter eight inches and a quarter, and in length, from the thickened to the thin margin, two inches and a half. The former we take to be the proximal margin; consequently the thin opposite edge will give support to the fin. The texture of this bone is quite similar to that of the large triangular carpal; namely, it is of a semicartilaginous appearance, with coarse radiating fibres extending from margin to margin.

Helodus simplex, Agassiz.

We take this opportunity to announce the occurrence of this strange form of tooth at Prestwick, Northumberland. Only a single specimen has been found; and we believe this to be the first that has been obtained in the district.

EXPLANATION OF THE PLATES.

PLATE XVII.

Fig. 1. View of *Pleuroodus Rankinii*, natural size: *a*, head; *b*, teeth; *c c*, thoracic expansions; *d*, dorsal spine; *e*, counter slab, on which the left thoracic expansion is preserved, and which is represented as if seen through.

Lanarkshire Coal-field, and on *Ctenacanthus hybodontoides*," Trans. Geol. Soc. Glasgow, vol. iv. pt. 1. pp. 57-59.

* "Investigations into the Structure and Development of the Scales and Bones of Fishes," by W. C. Williamson, Philosophical Transactions, 1851, pt. 1, pp. 669-679.

† Ann. Nat. Hist. ser. 4. vol. i. p. 369.

Fig. 2. Outline of a scale of *Platysomus rotundus*, considerably enlarged.

Fig. 3. Outline of a scale of *Platysomus Forsteri*, enlarged.

Fig. 4. Outline of a mandibular ramus of *Celacanthus lepturus*, slightly enlarged: *a*, articular piece; *b*, glenoid surface; *c*, dentary bone; *d*, teeth. The articular piece and dentary bone are laid together in their natural positions, but not united; so that the form and extent of each can be distinctly traced.

PLATE XVIII.

Fig. 1. Scale, natural size, of *Ctenodus* (first species): *a*, anterior margin; *b*, posterior or exposed ditto; *c*, marginal border; *d*, rupture exposing cast of upper surface; *e*, central area.

Fig. 2. Scale, natural size, of *Ctenodus* (second species): *a*, anterior margin; *b*, posterior extremity; *c*, marginal border; *d*, central area: the dotted line indicates the form and extent of the scale.

XXVII.—*The Mollusca of St. Helena.*

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WITH the assistance of my friend Mr. M^rAndrew, I have examined a collection of shells made by Mr. J. C. Melliss at St. Helena; and I subjoin a list of them. Most of the marine shells were picked up on the beach, and are consequently in bad condition. The only specimen procured from deepish water (about fifty fathoms) is *Ostrea crista-galli*; and this is covered with two kinds of stony coral, which Prof. Duncan refers to *Sclerohelia hirtella* and a species of *Balanophyllia*. The land-shells of St. Helena have been already noticed by the late Mr. G. B. Sowerby in the Appendix to Mr. Darwin's work on Volcanic Islands, as well as by Mr. Blofeld and the late Prof. E. Forbes in the Quarterly Journal of the Geological Society of London for August 1852. In the opinion of the last-named author, "a closer geographical relationship between the African and American continents than now maintains is dimly indicated" by the marine mollusks of St. Helena; and "the information we have obtained respecting the extinct and existing terrestrial mollusks of this isolated fragment of land would seem to point in the same direction, and assuredly to indicate a closer geographical alliance between St. Helena and the west [?east] coasts of South America than now holds." And in the Report of the British Association for 1851 will be found an abstract of a paper by the same distinguished naturalist, entitled, "On some Indications of the Molluscan Fauna of the Azores and St. Helena." It is here stated that "the marine mollusks [of St. Helena] would seem to point to the submergence of a tract of land probably linking Africa and